

# Singapore's Contribution to the Study of Palms

By C. X. FURTADO

Botanic Gardens, Singapore

BOTANICALLY PALMS are considered as the "Princes" of the vegetable kingdom, but they are also important economically. In some cases like the coconut palm it is possible not only to make a boat out of the timber but also to provide it with ropes, sails, cloth, flour, oil, sugar, wine, vinegar, spoons, brushes, brooms, drinking vessels, etc. all derived from the palm itself, showing thereby a variety of uses some palms have. Others like the *Nibung* made the Malaysian civilisation possible since its timber was needed not only for the boats but also for the houses, for no other cheap timber was available that could stand salt water and also resist the attack of termites and other destructive organisms. Similarly were it not for the leaflets of the two palms *Nipah* and *Rumbia* (Sagu), Malaysians would have experienced great difficulties to find for their houses and boats suitable attaps that would resist weather and the destructive action of white ants and other insects. Much of the sugar that was available to the original Malaysians in lowlands was derived from coconut and Kabong palms, since sugar cane could not be grown without being protected against the ravages of wild animals. The "dragon-blood" which was formerly exported to Europe and elsewhere for medicinal and other uses, was derived from some species of climbing palms known as rattans or rotang, a group of palms that provide what is commercially known as the Malacca cane used for making walking sticks, wicker chairs and other articles.

Now every species of a particular genus of plants has different properties and uses. This is one of the reasons why systematic botanists keep themselves busy in studying the characters by which different species and varieties of plants might be recognized. Systematic studies help to correlate the results of research workers in different branches of science or knowledge. Thus a dietician or nutritional chemist will want to classify the results on the different vegetable products used in the diets of the people, the pharmacist to know the plants used as medicines by the aborigines or the rural people; the police to know the plant poisons used in murders, suicides and other crimes; the veterinary officers to know the different kinds of plants used to feed, to poison, and to cure the animals; the fisherman to know the small plants that help the fishes

in pisciculture; the malaria controllers to know the plants that encourage or hinder the propagation of the mosquitoes; the silviculturists, the trees that yield the timbers suitable for different purposes, and so on. The systematic botanist is therefore an indispensable person for research workers and commercial men who have anything to do with plants or their products.

To classify plants that are not microscopic a large collection of dried specimens to illustrate the leaves, flowers and fruits as well as the natural variation between these is necessary, for only with a carefully preserved material in herbarium can a systematic botanist concentrate to detect the characters that distinguish one species or variety of plant from another. The need for such a collection is easily satisfied in case of plants which have fairly small twigs, leaves and fruits. But in the case of palms the difficulty is often a formidable one, both for the field botanist who collects the specimens in the field and for the systematist who arranges and studies the material in the herbarium. Many palms have large leaves and their stems are very bulky too. If one were to collect only one leaf and flowering branch of a large palm, they would form a great load for a person, whereas within the time and labour several dozens of specimens could have been made of large trees having small twigs, leaves, flowers and fruits.

Palms also show a good deal of difference in age. The leaves produced when the plants are young and not flowering are often completely different from those produced by a flowering stem. Further an inflorescence might appear completely male at one stage and completely female at another stage. Moreover in the early stages of flowering of a palm that produces both male and female flowers on the same spadices, often no female flowers are produced so as to make one imagine that the sexes are distributed on different plants.

In case of rattan palms, additional difficulties occur often in the better varieties that produce long climbing stems. The long, hooked whips which enable the plant to climb can entangle a collector tearing his clothes and wounding his skin in a way that it may be difficult to extricate him unless armed with a sharp knife. Since such climbing rattans produce flowers and fruits only when they reach to a great height on the trees which they climb, it becomes impossible to get fertile specimens essential for the herbarium except by cutting the rattan; but since the rattan does not climb straight and since the hooked whips are sometimes 15 ft. long or more and the hooks are reversed, it is not possible to pull such a rattan down even with a force of 10 to 15 men. Several times I

have had to fell 7 to 8 trees and treelets before getting the specimens of one rattan. Further all rattans have thorny sheaths on the leafy stem and the leaves themselves are also armed with hooks. This means that one has to use leather gloves and handle the whole material with care lest it injures the hands and fingers.

Now having obtained a rattan plant, how is one to make the specimens since each leaf or spadix is very large? In the early days when forest officers knew little about collecting palms, the Berlin palm specialist wrote to a forest officer in New Guinea to send him a good specimen of a palm that looked to be a new species though well known to the aborigines. The silviculturist immediately got his men active. He cut a palm with 30–50 ft. tall trunk and 18 inches thick, and had his men transport it to the nearest port whence the plant was shipped to Germany. On its arrival in Hamburg special arrangements had to be made in order to transport it to Berlin, and it was kept in the Museum for the benefit of the school children. But since during the transport the flowers and fruits were lost, the specimen was useless for a botanical study, though several hundreds of dollars were spent in getting the specimen from the jungles of New Guinea to the Botanical Museum of Berlin!

This digression will help to emphasize the need for the botanists to study the palms in living state in order to decide what parts are essential to enable him to distinguish the one species or variety of rattan from another, that is, the specimens that will not burden unnecessarily the collector and that, without occupying unnecessary space in the herbarium, will provide the necessary distinctive clues to the systematist. In this regard the observations made by the botanists in the field as well as on the plants grown in the Botanic Gardens of Bogor and Singapore have provided useful clues for making satisfactory specimens. And as far as the Malayan rattans are concerned, the Botanic Gardens of Singapore may be given the credit of having played the major role in the classification of the rattans, having secured in the initial stages the help of the great palm expert, the late Dr. O. Beccari of Florence, Italy, who had also studied the palms in the forests of Borneo and New Guinea and those collected by the staff of the Botanic Gardens of Bogor and Singapore.

In the course of these studies the status of several doubtful ones has been cleared, some passing under two or more names because of some variation due to age or ecological conditions have been merged into one, several new species and varieties have been described and the generic distinctions have become better understood. In 1907, for instance, Ridley who, as said above, had enlisted

the help of Professor Beccari of Florence, described in his *Materials* 86 species of rattans under 6 genera, of which 16 species were new, that is, in addition to those new species described by Beccari from the specimens collected by the Singapore Gardens' Department. Later in his *Flora of the Malay Peninsula V* (1925) Ridley described 94 species of rattans (with 5 new species) under 7 genera. In 1951-56, Furtado described and illustrated in the *Gardens' Bulletin*, Singapore, 127 species of Malayan rattans under 10 genera, of which one was a new genus and 28 new species and several varieties and new records of species previously known only from non-Malayan regions.

However the study of the Malayan palms is not yet complete. A proper field survey of all the palms is needed in order to build up an adequate herbarium in Singapore, and in this the co-operation of the Forest Officers is valuable, since they make frequent trips to the jungles and can make valuable collections whenever a coupe is felled for timber. If a comparative systematic study were made of the palms from the Malaysian region including Assam, Burma, Lower Siam, Malaya, Sumatra, Java and the neighbouring islands, it should yield much valuable knowledge of the palm genera and species occurring in this region, their distribution, and the range of intra-specific variation and other characters.